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Memorandum

To:	Jeffery M. Reid/ Michael Gunner
From:	Tyler Hunt, PE/Richard Haberman, PE
Subject:	Riverstone (formerly Gateway Village) Anti-Degradation Study and Associated Studies
Date:	January 14, 2015

Jeff,

Per your request via letter dated December 19, 2014, AECOM reviewed the material provided in the DVD accompanying your letter which included the Anti-degradation Study and other material accompanying the Report of Waste Discharge, Riverstone WWTF dated June 2014. The Anti-degradation study confirms the differences between the Tentative Waste Discharge Requirements (WDRs) for the Root Creek Water District's Riverstone WWTF when compared to the proposed design as set forth in the Infrastructure Master Plan (IMP) included in the Gateway Village Environmental Impact Report (EIR) which was approved on 11 September 2007. The major deviations are noted in the table below followed by additional explanation of why the deviation should be considered significant:

Deviations	**Gateway Village EIR**	**Riverstone WWTF WDRs** **Anti-Degradation Study**
1. First phase treatment level	Secondary, disinfected (Appendix G, section VI, subsections B and C)	Secondary, undisinfected (page 2 of WDRs, paragraph 6)
2. First phase treated effluent disposal	Disposal to dedicated cropland (Appendix G, section VI, paragraph 1 and subsection B)	Disposal to percolation/evaporation ponds (page 2 of WDRs, paragraph 6 and Attachment B)
3. First phase treated effluent storage	Storage in lined ponds (Appendix G, section VI, subsection D)	Storage in percolation/evaporation ponds (page 2 of WDRs, paragraph 9)
4. First phase treatment process	Site plan includes chlorine contact tanks for disinfection (Appendix G, section VI, figure G-1)	Plant flow schematic does not include chlorine or any other disinfection process (Attachment B)
5. First phase biosolids processing	Class A, utilizing digestion or composting (Executive Summary, section VII, subsection F)	Class B, disposal by drying and hauling or hauling of wet sludge in bins (page 3 of WDRs, paragraph 12 and Attachment B)

Deviation 1 The EIR states that the WWTF would produce a secondary disinfected effluent which is considered a higher level of treatment than secondary undisinfected. The disinfection step reduces pathogens which is safer for the public and allows for an increased variety of reclamation options. The WDRs propose that the WWTF will produce a secondary undisinfected which reduces the reclamation options and can present a public health issue.

Deviation 2 The disposal of treated effluent to dedicated cropland as stated in the EIR is considered beneficial because the plants take up the nutrients in the effluent and minimize the potential for nutrient migration into the groundwater table. Also, use of the effluent as a supplement to regular irrigation reduces demand for surface and groundwater supplies.

Deviation 3 The EIR states that the treated effluent will be stored in lined ponds when demand for irrigation water is minimal which provides a high level of protection for the groundwater. The WDRs have revised the storage method to percolation/evaporation ponds that provide no protection for the groundwater from harmful nutrients.

Deviation 4 The WDRs delete the disinfection step that was included in the approved EIR. As stated above, the disinfection of the effluent is an important step in providing a safe, usable product for reclamation.

Deviation 5 The EIR specifically states that all sludge will be processed and treated so that it may be classified as Class A, suitable for disposal with minimum restriction on use. The WDRs state the sludge may be dried and hauled, or alternatively, stored wet in bins and hauled off-site. These options will produce a sludge that is classified as Class B. Use of Class B sludge entails significant disposal restrictions while the storage and hauling of Class B sludge may present public health and nuisance issues.

Also included in the materials provided is a memorandum dated July 17, 2014 from David McGlasson to Chris Campbell that provides some direction on calculating water balances for development projects. In the memorandum, Mr. McGlasson points out that due to the unknown factors occurring underground, the proper course of action is to reduce a projects total estimated percolation to the aquifer by 50%. AECOM reviewed the water balances included in Appendix E of the Riverstone WWTF ROWD and found that the report includes a full, 100% credit of percolation to the aquifer. By applying the 50% reduction factor recommended by Mr. McGlasson, the following over estimations of aquifer recharge were noted in the water balance calculations for the Riverstone WWTF:

Project Phase	Volume of Effluent to Percolation per ROWD (ac-ft per year)	Calculated Percolation per ROWD (ac-ft per year)	Actual Percolation with Recommended 50% Reduction (ac-ft per year)	Calculated Percolation per ROWD (ac-ft per life of project phase)	Actual Percolation with Recommended 50% reduction (ac-ft per life of project phase)	Difference (ac-ft per life of project phase)
Initial Plant (10-yr life)	336	272	136	2,720	1,360	1,360
Ultimate Plant, Phase 1 (10-yr life)	403	326	163	3,264	1,632	1,632

Ultimate Plant, Phase 2	829	672	336	N/A	N/A	N/A

Note: The above percolation rates ignore precipitation. The 19% evaporation rate was calculated from the water balance included in Appendix E of the Riverstone WWTP ROWD.

Please contact me if you have any questions regarding the above information.

Sincerely,

Tyler Hunt, PE